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Forest Insect Conditions on the Teton National Forest for 1966

The following report is a synopsis of the major Forest insect problems encountered on the Teton National Forest this year. This material was compiled from aerial survey data from special mountain pine beetle evaluation surveys, and by frequent visits to specific problem areas.

The principal Forest insect problems this year were the same as in 1965, namely, the mountain pine beetle and the sugar pine tortrix on lodgepole pine. The mountain pine beetle continues to be the number one insect problem and the primary killer of an estimated 1,000,000 lodgepole pine this year. The infestation has pushed even deeper into the Wilderness Area and continues to pose an even greater threat to the lodgepole stands of Yellowstone National Park. Serious buildups have developed in many of the side tributaries of the Hoback River Drainage and continued tree killing occurred near Slide Lake in spite of control efforts. Wherever control was undertaken, however, beetle populations and subsequent tree mortality has declined. Predictions based on systematic evaluation surveys indicate, with few exceptions, increased mountain pine beetle activity for 1967. The sugar pine tortrix continues to defoliate new growth of lodgepole pine in specific areas but the extent of damage decreased from that reported last year. A more detailed discussion of these two insect problems follows:

Mountain pine beetle, Dendroctonus ponderosae Hopk.

The mountain pine beetle continues to take a heavy toll of lodgepole pine in many areas of the Teton National Forest. The infestation has continued to spread in both intensity and extent with the largest and most serious infestation persisting in the Teton Wilderness Area, where the mountain pine beetle has killed at least as many trees this year as last and continues to push even deeper into the upper reaches of the Snake and Buffalo Rivers. In the upper portions of most of these tributaries, further beetle movement has been restricted only by the absence of favorable host type. These transition areas consist of scattered, small diameter lodgepole mixed with spruce and subalpine fir, merging into spruce-fir and limber pine. Wherever limber pine occurs it, too, has been attacked and killed by the mountain pine beetle.

The infestation continues its slow but steady movement to the north and in some areas it has moved into the contiguous lodgepole stands in Yellowstone National Park. Infestations vary in size from individual and widely scattered groups of 3-10 trees to single groups of 100-300 trees. The largest infestations remain in approximately the same areas as were reported last year: Rodent Creek, Coulter Creek, and Wolverine Creek. New groups of recently killed trees have shown up for the first time in the headwaters of the Snake River and between the Snake River and Fox Creek. Many more scattered groups of 3-10 trees occur north of Jackson Lake, in Glade Creek, and near the south entrance of Yellowstone National Park. Additional activity consisting of five to six small groups containing 3-10 trees each was detected in Yellowstone Park between Beula Lake and the National Forest boundary.

Control efforts have reduced the beetles impact and lessened tree killing

in many of the lodgepole stands south of the Buffalo River and in the Antelope Mountain area.

Areas containing trees sprayed standing were difficult to assess from the air, however, because treated trees could not be distinguished from nontreated trees.

A serious situation now exists throughout the Hoback River drainage and its tributaries. The beetle has established itself in new areas, accelerated its activity in existing infestations, and extended its distribution over a much wider area. Explosive type buildups have developed in portions of Willow, Granite, Cliff, and Short Creeks with continued, but less serious, killing occurring in Jack Creek, the upper reaches of the Hoback River, and Fisherman Creek to Kismet Peak. These and other infestation areas are shown on the copy of the aerial survey map mailed to the Forest Supervisor at an earlier date.

Biological data supplemented by firsthand observations indicate static to increasing conditions for the areas between the Buffalo River and the Wilderness boundary, and from Ditch Creek north to Rosies Ridge. In spite of these relatively optimistic predictions, however, control efforts should not be abandoned for the beetle will still continue to attack and kill thousands of trees in these areas.

In the Wilderness Area and in most other noncontrol areas, mountain pine beetle populations remain epidemic and as many or more trees will be attacked and killed in 1967 as were this year. Natural factors such as parasites and predators were not abundant enough to significantly reduce this year's brood to a less damaging level. In the absence of artificial control, the beetle will continue unabated until other factors, now unforeseen, combine to reduce the infestation level.

The absence of suitable host material may be one factor that will curtail the infestation in many areas. The nontreated stands north of the Buffalo River extending into the Wilderness Area have undergone several successive years of host depletion. If tree killing continues at the present rate, it will be only a matter of a few years before the stands are depleted to the extent they will not support beetle populations. The beetle has already extended its boundaries by moving into the fringe lodgepole stands in the uppermost drainages of the Wilderness Area. Here, once the remaining suitable host trees are attacked and killed, the beetles' only chance of survival will be to subsist in smaller diameter trees or extend the infestation boundaries to include contiguous areas of suitable host trees; if it does neither of these, it will die out by depleting itself from within. Host depletion is also thought to be responsible for an apparent decline in population numbers in Dell Creek and in the North Fork of Fisherman Creek where control work was terminated in 1963.

Elsewhere in the main Hoback Drainage and its upper tributaries, tree killing will increase wherever suitable host lodgepole is present.

The infestation near Slide Lake in the Gros Ventre area continues to persist in spite of intensive control efforts. Examinations showed approximately one to one and one-half new attacks for every old attack, and brood counts forecast a continued epidemic condition for 1967.

In 1964 and 1965 a few adult beetles remained in the "red top" trees until the following spring, and it was suspected that they might emerge prior to the main flight and possibly attack new trees. To determine whether or not this early emergence occurred, several "faders" containing adult beetles were caged last fall and early this spring. Periodic examinations of the caged trees were made beginning in the late spring and ending before the main flight period. Some early emergence was found but the numbers were too few to be of importance. In the field, no spring flights were observed nor were there any new attacks found. Although not observed, it is possible that a few of the early emerging beetles may have entered previously attacked trees but they cannot be readily distinguished from those overwintering parents that resumed egg laying with the onset of warm spring weather.

Over the season, any initial variation in brood maturation usually levels out by the later development stages, at which time almost simultaneous emergence occurs. This year the crest of emergence over the Forest as a whole was during the last week in July.

Forest-wide, with the few exceptions previously described, the mountain pine beetle remains epidemic and the number of trees killed in 1967 will equal or exceed those killed this year. Natural control factors and variable brood conditions existing in the neighboring Targhee Forest, which may change the course of the infestation there, are not present on the Teton Forest this year. There is a somewhat remote possibility that subsequent biotic forces may reduce the infestation potential this winter and next spring, but their significance will not be determined until next spring.

Sugar pine tortrix, Choristoneura lambertiana (Busck).

Past defoliation of lodgepole pine was caused by a complex of lepidopterous defoliators, namely, the sugar pine tortrix, Choristoneura lambertiana, the jack pine budworm, Choristoneura pinus, and the pine needle sheath miner, Zelleria haimbachi. This year, because of interspecies competition and a host of unknown biological factors, the sugar pine tortrix became the principal defoliator while its competitors were reduced to only a minor occurrence.

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The only known area of lodgepole defoliation this year, as evidenced by the aerial survey, is approximately 1,200 acres of light to moderate activity between Fall Creek and South Fall Creek. The 800-acre infestation in Coburn Creek, discovered in 1965, all but disappeared this year. This year's infestation may be more extensive than that reported since certain characteristics of the host tree coupled with peculiar feeding habits of the insect make absolute detection from the air extremely difficult.

Feeding damage by the sugar pine tortrix is confined almost entirely to the new growth. All lodgepole pine regardless of age, size, or crown position are fed upon. Defoliation is more prominent in the upper one-third of the crown early in the season. As the larvae grow, they consume the uppermost terminal and lateral growth then move into the mid and lower crowns, feeding as they go. Under heavy population pressure, practically all of the new growth is consumed.

Although the Fall Creek infestation may have gone undetected until this year and experienced successive years of defoliation previously, it is doubtful whether lasting damage to the trees occurred. Experience in other infestations has shown that trees subjected to successive years of repeated defoliation will recover, once given a respite from insect activity. Continued stress resulting from heavy prolonged feeding activity will probably result in growth loss, however, and may lower the tree's resistance to other injurious insects - secondary as well as primary. These effects have yet to be accurately determined.

This infestation may be actually an extension of the large outbreak on the Targhee Forest to the west. Since this infestation has been in progress, we have had some opportunity to observe and record information concerning the biology and habits of the insect, heretofore unknown. These efforts will be continued in order to secure meaningful data needed to accurately predict future damage. Egg mass samples were taken in the Targhee infestation as an initial indication of next year's population level, but comparative population data is lacking. It was clear, however, that biological control such as parasites, predators, disease, starvation, and other limiting forces were not sufficient to have had an adverse effect on this year's population. Unless additional factors limit insect numbers between now and next spring, no change in either the extent or intensity of the infestation is foreseen for 1967.

/s/ William H. Klein

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